

Bellwork: 5/29/13

Write the polynomial
given the zeroes:

$$x = 0, 1, -3$$

$$x(x-1)(x+3)$$

$$x(x^2 + 3x - x - 3)$$

$$x(x^2 + 2x - 3)$$

$$y = x^3 + 2x^2 - 3x$$

Given that one zero of

$$f(x) = x^3 + 9x^2 + 23x + 15$$

is -5. What are the other TWO
zeroes.

$$\begin{array}{r|rrrr} -5 & 1 & 9 & 23 & 15 \\ & \downarrow & -5 & -20 & -15 \\ \hline & 1 & 4 & 3 & 0 \end{array}$$

$$x^2 + 4x + 3 = 0$$

$$(x+3)(x+1) = 0$$

$$\begin{array}{l} x+3=0 \\ x=-3 \end{array}$$

$$\begin{array}{l} x+1=0 \\ x=-1 \end{array}$$

7.5 - Using Logarithms to solve exponential equations

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Objective: Use logarithms to solve exponential equations

Using logarithms to solve exponential equations:

- Steps:
- 1) isolate the exponential term on one side of the equation
 - 2) write the word log in front of each term on each side of the equation
 - 3) use the exponent properties to rewrite the expression
 - 4) solve for x

Example 1: $5^x = 75$

$$\begin{aligned}\log 5^x &= \log 75 \\ x \cdot \cancel{\log 5} &= \frac{\log 75}{\cancel{\log 5}} \\ x &= \frac{\log 75}{\log 5} \\ x &= 2.68\end{aligned}$$

Example 2:

$$\begin{aligned}7^{x+1} &= 150 \\ \log 7^{x+1} &= \log 150 \\ (x+1) \cancel{\log 7} &= \frac{\log 150}{\cancel{\log 7}} \\ x+1 &= 2.57 \\ x &= 1.57\end{aligned}$$

Try These:

1) $6^x = 1296$

$$\log 6^x = \log 1296$$

$$\frac{\log 6^x}{\log 6} = \frac{\log 1296}{\log 6}$$

$$\boxed{x = 4}$$

2) $4^{x+1} = 100$

$$2.32$$

3) $2^{x-3} = 25$

$$7.64$$

4) $5^{3x-1} = 49$

$$1.14$$

Solving Exponential Equations with Logarithms

Date_

Solve each equation. Round your answers to the nearest ten-thousandth.

1) $3^b = 17$

2) $12^r = 13$

3) $9^n = 49$

4) $16^v = 67$

5) $3^a = 69$

6) $6^r = 51$

$$7) 6^n = 99$$

$$8) 20^r = 56$$

$$9) \frac{1}{5} \cdot 18^{6x} = \frac{26}{5}$$

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$$11) 9^{n+10} \div 3 = 81$$

$$9^{n+10} = 78$$

$$\log 9^{n+10} = \log 78$$

$$12) 11^{n-8} - 5 = 54$$

$$11^{n-8} = 59$$

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$$13) 16^{n-7} + 5 = 24$$

$$14) 20^{-6n} + 6 = 55$$

$$15) 5 \cdot 6^{3m} = 20$$

$$16) 8^{-5a} - 5 = 53$$

$$17) 3.4e^{2-2n} - 9 = -4$$

$$18) -6e^{8n+8} - 3 = -23$$